

CECW-ED

**DEPARTMENT OF THE ARMY  
U.S. Army Corps of Engineers  
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Technical Letter  
No. 1110-2-355

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**Engineering and Design  
STRUCTURAL ANALYSIS AND DESIGN  
OF U-FRAME LOCK MONOLITHS**

**1. Purpose**

This engineer technical letter (ETL) provides guidance for performing structural analysis of U-frame monoliths for navigation locks.

**2. Applicability**

This ETL applies to all HQUSACE elements, major subordinate commands (MSC), districts, laboratories, and field operating activities (FOA) having responsibilities for the design of civil works projects.

**3. Discussion**

Design and analysis of U-frame lock monoliths is a complex structural engineering task. It involves many assumptions and methods not required for

design of other types of structures. First-time designers of U-frames may overlook some of these key assumptions and methods, possibly resulting in either an uneconomical or an inadequate design. The appendixes to this ETL present a recommended procedure for design of U-frame lock monoliths, based on recent experience at several design districts.

**4. Action**

Structural engineers should review Appendix A prior to initiating design of a U-frame lock. It should be used as a guideline for developing the design process and required design resources. Modifications to the recommended procedure may be appropriate based on the designer's previous experience and on specific project conditions. However, such modifications should be developed in consultation with the design team, appropriate MSC personnel, and CECW-ED.

FOR THE DIRECTOR OF CIVIL WORKS:



PAUL D. BARBER, P.E.  
Chief, Engineering Division  
Directorate of Civil Works

2 Appendixes  
APP A - Structural Design and Analysis  
of U-Frame Lock Monoliths  
APP B - References